UNDERBED HITCH MOUNTING SYSTEM

TECHNICAL FIELD AND RELATED APPLICATIONS

[0001] This application is a continuation of U.S. patent application Ser. No. 16/564,188, filed on Sep. 9, 2019, titled "Underbed Hitch Mounting System," which is a continuation of U.S. patent application Ser. No. 15/469,073, filed on Apr. 25, 2017, now U.S. Pat. No. 10,406,873, titled "Underbed Hitch Mounting System," which claims priority to U.S. Provisional Patent Application Ser. No. 62/327,486 filed on Apr. 26, 2016, each of which are hereby incorporated by reference.

[0002] The present invention relates generally to a towing apparatus and, more particularly, to an underbed hitch mounting system.

BACKGROUND

[0003] Many vehicles are designed to transport freight, goods, merchandise, personal property, and other such cargo. Often, a hitch assembly is utilized to connect a towed vehicle or trailer to a towing vehicle, such as a truck for example, to increase the capacity to transport goods. Many types of coupling devices have been developed for providing this connection between a towing vehicle and a towed vehicle.

[0004] It is well known to utilize a trailer hitch to connect a trailer to a towing vehicle. There are many different types of trailer hitches that may be attached to the towing vehicle in a variety of ways, depending on the type of hitch to be used. Some of the most common types of hitches include gooseneck, fifth wheel, front mount, and the like. Often, the type of hitch used to connect a trailer and a vehicle is determined by the size, shape and other features of the trailer. For example, large trailers such as semitrailers and campers often require a fifth wheel hitch, whereas, small and midsized trailers, such as boat trailers, are better suited for gooseneck trailer hitches. Typically, trailers are connected to a towing vehicle by way of a ball hitch secured to the vehicle and a ball socket coupling mechanism on the trailer that mounts over the ball and thereby allows for the trailer to pivot behind the towing vehicle.

[0005] Due to the size and weight of many trailers, towing a trailer may cause unsafe conditions for the towing vehicle, such as fishtailing or other unsafe effects. To avoid these unwanted effects, the weight of the trailer is preferably, evenly balanced and distributed over the wheels of the towing vehicle. Thus, the hitch may be connected to the frame or base of the towing vehicle near the vehicle's center of gravity, and fifth wheel and gooseneck hitches mounted to pickup trucks are often connected to the truck frame underneath the bed of the truck.

[0006] Traditional fifth wheel hitches include a head assembly for receiving a king pin on a trailer, a base having a plurality of legs, and one or more mounting rails. The mounting rails may be permanently fixed to the frame of a vehicle, such as a pickup truck. For example, the mounting rails may be connected between two portions of a pickup truck frame underneath the truck bed. The mounting rails may include a plurality of holes for receiving the legs of the fifth wheel hitch.

[0007] Corresponding openings may be cut in the truck bed and aligned with the holes in the mounting rails. The legs of the fifth wheel hitch may be connected to holes in the mounting rails through the openings in the truck bed, thereby securing the fifth wheel hitch to the frame of the truck. When the fifth wheel hitch is not in use, the legs may be disconnected from the holes in the rails and the hitch may be removed from the bed of the truck. Caps may be placed over the holes to allow the truck bed to be used for other purposes.

[0008] Traditional gooseneck hitches also mount to a pickup truck frame, beneath the bed of a truck. A gooseneck hitch is designed for use in a pickup truck similar to a fifth wheel. The difference is that the gooseneck uses a ball and coupler verses a kingpin and pin receiver. Gooseneck hitches include a mounting plate configured to connect to the frame of a truck, a receptacle in the mounting plate configured to receive a ball hitch, and a hitch ball removably connected to the receptacle and configured to engage a coupling member of the trailer. An opening in the bed of the truck is aligned with the receptacle in the mounting plate, allowing the hitch ball to connect to the receptacle through the opening in the truck bed. The hitch balls themselves are typically removable or retractable so that when the hitch is not in use, the hitch ball may be removed or retracted when not in use, so as not to obstruct the bed of the pick-up truck in any significant manner.

[0009] Towing vehicles are generally adapted to accommodate either a fifth wheel hitch or a gooseneck hitch, but not both. As previously noted, fifth wheel hitches and gooseneck hitches are preferably mounted to the vehicle frame near the vehicle's center of gravity but, because fifth wheel hitches and gooseneck hitches use different mounting configurations, only one hitch can physically occupy that location. Thus, converting a towing vehicle from a fifth wheel hitch to a gooseneck hitch (or vice versa) is inefficient and can be quite time and labor intensive.

SUMMARY

[0010] An apparatus for towing vehicles that selectively accommodates either a fifth wheel hitch or a gooseneck hitch without the need for a conversion process would be welcomed. Accordingly, an underbed hitch mounting system is described. The mounting system may be utilized for towing vehicles wherein the mounting system may selectively accommodate either a fifth wheel hitch or a gooseneck hitch. The mounting system may include at least one rail connectable to a vehicle frame, wherein the rail includes at least one socket. The socket engages with a receiving member, while the receiving member engages a leg of a fifth wheel hitch. A separate mid rail, connectable to the rails, includes a gooseneck hitch ball socket.

[0011] In one aspect, the invention comprises any combination of the following features:

[0012] A pair of parallel end members laterally spaced apart;

[0013] First and second cross rails positioned at non-orthogonal angles relative to the end members, wherein the first and second cross rails intersect between the end members to define a mid rail section having a hitch ball socket;

[0014] Four receiving members, wherein each cross rail has two receiving members formed in opposing ends with the hitch ball socket disposed at a distance between the two receiving members, wherein the four